



# A REVIEW ON MYOFASCIAL PAIN DYSFUNCTION SYNDROME

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## ABSTRACT

Myofascial pain dysfunction syndrome (MPDS) is a type of temporomandibular disorders characterized by dull, aching, radiating pain that may become acute during use of the jaw, and mandibular dysfunction that generally involves a limitation of opening. MPDS is a functional disease related to the masticatory muscles, the neural structures and the temporomandibular joint structures. Frequently, myofascial pain is overlooked as a common cause of chronic pain because of frequent association with joint dysfunction and other pain disorders.

Noxious stimulation such as mechanical, emotional, infectious, metabolic, nutritional, or a combination of these may lead to development of spasm with loss of capacity for voluntary relaxation and exhibit an overactive stretch reflex leading to involuntary shortening of one or more muscles with eccentric position of condyles. There is disorientation of jaw movements and restricted opening of the mouth, and pain due to spasm and decreased relaxation of muscles. This review article focuses on pathophysiology and management of MPDS. Since the etiology of MPDS is multifactorial, the treatment of MPDS should be geared towards complete management rather than symptomatic cure.

**KEY WORDS:** Myofascial pain dysfunction syndrome, temporomandibular disorders, masticatory muscle problems.

## INTRODUCTION:

Study of pain is vast, as pain may be present in different aspects of life described in terms of physical as well as psychological. Facial pain and its diagnosis has always posed a dilemma for the clinicians. Temporomandibular joint (TMJ) pain dysfunction syndrome is a term covering a variety of problems which include the entire scope of temporomandibular joint disorders originating either intra articular or extrarticular. (Batysheva, 2008) (Mikhail, 1980).

The study of temporomandibular joint appears to hold an uncommon fascination for clinicians of many disciplines. The dysfunction of this joint results in a large proportion of complaints to the physician. Myofascial pain dysfunction syndrome (MPDS) is a stomatognathic system disturbance, which consists of pain, jaw movement irregularities, and muscle spasm. Hyperexcitation of peripheral sensory neurons causes a reaction of induction in the motor neuron and then spasms of the masticatory muscles follow. Long-term spasm causes muscular pain and irregular mandibular motion. Pain is the most important inducer and therefore must be managed firstly in order to manage the muscle spasms. With ever increasing refinements in diagnostic and treatment modalities, dramatic advances have been made in understanding the causes of facial pain related to joint and surrounding musculature. Still the mystery exists regarding the precise diagnosis and treatment of facial pain. Myofascial pain dysfunction syndrome (MPDS) is one particular type of temporomandibular disorder. Historically, clinicians and researchers have subclassified TMDs into either intracapsular disorders or masticatory muscle disorders (such as local myalgia, myofascial pain, centrally mediated myalgia, myospasm, myositis, myofibrotic contracture, and masticatory muscle neoplastic disease) (Mikhail, 1980). TMJ internal derangement may not be involved with MPDS. However, when a temporomandibular joint irregularity occurs along with the symptoms of MPDS, the complete problematic condition should be considered as temporomandibular joint disease. All masticatory organs participating in oral function may or may not be involved in MPDS. The condition is characterized by dull, aching, radiating pain that may become acute during use of the jaw, and mandibular dysfunction that generally involves a limitation of mouth opening. MPDS is a functional disease related to the masticatory muscles, the neural structures and the temporomandibular joint structures (Laskin, 1986). Frequently, myofascial pain is overlooked as a common cause of chronic pain because of frequent association with joint dysfunction and other pain disorders.

## ETIOLOGY:

Myofascial pain-dysfunction syndrome has a multifactorial etiology and the knowledge about the probable etiological factors seem to have improved over a period of time. The relationship between muscle malfunction and MPDS is a two-sided problem, where each affects the other. Muscle malfunction triggers MPDS, while MPDS causes impairment of masticatory movements. Goodfriend (1993), Costen (1934) and many others initially advocated the probable etiologies for the dysfunction syndrome. Lot of confusion existed until, Travell and Rinzler first suggested skeletal muscles in spasm could be the source of pain. They described about the painful areas within the muscles and called them as "Trigger areas" which were associated with pain, spasm, tenderness and dysfunction.

Schwarz (1955) adapted Travell's work and postulated the term temporomandibular joint pain-dysfunction syndrome. He hypothesized that stress was a significant cause of clenching and grinding habits, which resulted in muscle spasm with occlusal abnormalities playing secondary role. The next significant development towards understanding this aspect of facial pain occurred when Laskin (1969) presented a comprehensive explanation of the problem and proposed his Psychophysiological theory. He suggested that mechanical factors related to occlusion cause this condition by producing muscular overextension or overcontraction leading to muscle fatigue but is the primary factor responsible for signs and symptoms of pain-dysfunction syndrome. Laskin's theory is based on result of emotional rather than occlusal or mechanical factors. According to Weinberg (1974) every patient has got adaptation which is determined by his psychological make up. In a given patient, an occlusal interference may trigger the patient's acute symptoms and emotional stress may sustain them. Trenouth (1978) observed that jaw pain and limitation of movement were often noted to be worse on awakening. Christensen (1981) and Yemm (1979) demonstrated that in chronic cases, an inflammatory stage occurs in affected muscles of mastication following the classic spasm. This myositis perpetuates the symptoms of pain and dysfunction. (Mikhail, 1980) (Kawazoe, 1980) (Lynch, 1997). The peripheral neural receptors that are located in and around the posterior teeth periodontal ligaments and in the dental pulp create ongoing masticatory muscle hyperactivity that can lead to the clinical appearance of myofascial pain dysfunction syndrome symptoms.

## PATHOPHYSIOLOGY OF MPD SYNDROME:

Noxious stimulation such as mechanical, emotional, infectious, metabolic, nutritional, or a combination of these may lead to development of spasm with loss of capacity for voluntary relaxation and exhibit an overactive stretch reflex leading to involuntary shortening of one or more muscles with eccentric position of condyles. There is disorientation of jaw movements and restricted opening of the mouth, and pain due to spasm and decreased relaxation of muscles. (Kawazoe, 1980) (Clarke, 1977). Women are affected by MPDS more frequently than men. The greatest incidence appears to be in the 20 to 40 years age. Myofascial pain is characterized by pain referred from few hypersensitive areas termed as trigger areas zones. A trigger point is defined as a localized tender area in taut band of skeletal muscle, tendon or ligaments. Points occur frequently in head, neck, shoulder, lower back. Any pressure on these areas may initiate pain referred to distant areas (called as zone of reference). Patients suffering from MPDS usually present with complaint of pain in a zone of reference. (Mikhail, 1980) (Laskin, 1986) (Kawazoe, 1980). Trigger areas develop due to direct and indirect trauma (parafunctional habits) to muscles. Palpating trigger points with deep finger pressure elicits alternation in pain, in the zone of reference or causes radiation of pain towards the zone of reference. Patients behavioral reaction to firm palpation of trigger points is a distinguishing characteristic of myofascial pain and is termed a positive 'jump sign'. Signs and symptoms of myofascial pains are often accompanied by other pathological conditions and other problems such as tingling, numbness, blurred vision and excess lacrimation. Gastrointestinal symptoms include as nausea, constipation and indigestion. Musculoskeletal symptoms include fatigue, tension, stiff joints. Otologic symptoms include tinnitus, ear pain

and diminished hearing. (Batysheva, 2008) (Mikhail, 1980) (Laskin, 1986).

### MANAGEMENT:

The cardinal signs and symptoms of MPD syndrome are similar to those produced by many problems involving the temporomandibular joint and other non-articular conditions. Therefore, a careful history and thorough examination may be helpful in diagnosing the condition along with recent advances like T-scan. Radiographs may be helpful in diagnosing the condition if it has affected the bony structure also. Radiographs include transcranial, transpharyngeal, panoramic views, CT scans and MRI with arthroscopy which provide reliable diagnosis of the condition. (Mikhail, 1980) (Kawazoe, 1980) (Laskin, 1986) (Lynch, 1997).

The treatment of MPDS should be geared towards complete management rather than symptomatic cure. Patients should be explained about the problem and its probable etiology. Intake of soft diet should be encouraged, jaw motion should be limited and wide opening of mouth should be avoided. Parafunctional habits such as clenching, grinding, fingernail biting, lip biting etc. should be avoided. Intermediate moist heat application for half an hour twice daily is recommended. (Kawazoe, 1980) (Laskin, 1986) (Lynch, 1997).

Muscle relaxants and analgesics like benzodiazepines, acetaminophen and antidepressant drugs for patients with long standing MPDS and proven depression. (Travell, 1960). Chou R et al (2004) in their review article assessed the evidence for the comparative efficacy and safety of skeletal muscle relaxants for spasticity and musculoskeletal conditions. Randomized trials (for comparative efficacy and adverse events) and observational studies (for adverse events only) that included oral medications classified as skeletal muscle relaxants by the FDA were sought using electronic databases, reference lists, and pharmaceutical company submissions. Searches were performed through January 2003. The validity of each included study was assessed using a data abstraction form and predefined criteria. There was fair evidence that baclofen, tizanidine, and dantrolene were effective compared to placebo in patients with spasticity (primarily multiple sclerosis). (Kawazoe, 1980). Alpaslan et al (Alpaslan, 2012) undertook a study to evaluate the comparative efficacy of four different types of muscle relaxants on the symptoms of the temporomandibular dysfunction (TMD) syndrome and to evaluate whether agents with antianxiety action provide better relief of symptoms. This randomized controlled single blind clinical trial was completed on 79 patients with the clinical diagnosis of myofascial pain. Patients were randomly divided into four groups. In each of the four groups, patients were given a different type of muscle relaxant three times a day for three weeks. A fifth group of control patients, who did not receive any medication, was later studied in a similar manner. A significant decrease in pain and mandibular dysfunction was found in all groups. Muscle relaxants with sedative effects were not found to be more efficient in relieving the symptoms than were non-sedating medications. With all four drugs, the reduction of pain continued with time of follow-up. Sharmila et al (2015) studied about the muscle relaxants useful in treating the TMJ disorders. Various mechanisms behind the muscle relaxants like diazepam, metaxalone, alprazolam, carisprodol and cyclobenzaprine were useful in treating temporomandibular joint disorder. Diazepam appeared to reduce spasticity by enhancing the inhibitory effects of neurotransmitter GABA. It also exerted some supraspinal sedative effect. Diazepam had efficacy in patients with spinal cord injury, hemiplegia, and multiple sclerosis. This study is aimed to treat the temporomandibular disorder using the muscle relaxants and bring the overall awareness. (Clarke, 1977). Marfedini D et al (2004) carried out a study to evaluate the usefulness of tizanidine hydrochloride in the treatment of myofascial pain of the masticatory muscles. At the end of the treatment period all patients had improved; 42/78 patients (53.8%) showed absence of clinical symptoms; 23.1% showed a good improvement. Given the absence of papers on the use of tizanidine hydrochloride in the treatment of myofascial pain of the masticatory muscles, this investigation provided some preliminary data about its possible efficacy. He suggested that Randomized and controlled clinical trials are needed to confirm these results. (Dohrmann, 1978). Reyes et al (Reyes, 2014) stated that the most prevalent and debilitating pain conditions arose from the structures innervated by the trigeminal system (head, face, masticatory musculature, temporomandibular joint and associated structures). Orofacial pain (OFP) can arise from different regions and etiologies. Temporomandibular disorders (TMD) are the most prevalent orofacial pain conditions for which patients seek treatment. For the optimal treatment of orofacial pain disorders, both non-pharmacological and pharmacological modalities should be approached.

Apart from pharmacological aspects, various types of splints like soft and hard splint, relaxation split, resilient splint, pivoting splint can be used. (Gözler, 2017). Ultrasounds, cryotherapy, vapour coolant sprays are also one of the advances in treatment. Emphasis can be given to relaxation therapy. Because MPDS is basically a problem related to increased muscle tension and spasm, any technique designed to induce muscle relaxation should be helpful. Transcutaneous Electrical Neural Stimulation – TENS is based on the concept that stimulation of cutaneous branches of fifth nerve (trigeminal) creates an inhibitory effect on the trigeminal spinal tract nucleus, thus reducing the awareness of pain and relaxing the muscles. (Sharmila, 2015).

### CONCLUSION:

MPDS commonly afflicts the masticatory musculature with chronic muscular

pain, frequent temporal headaches, chewing pain and weakness, opening limitations, and frequent clenching and bruxing of teeth. An accurate diagnosis is accomplished by careful history taking and thorough examination. The application of proper therapy is related to the understanding that MPDS is a stress induced psychophysiological disease originating in muscles and not a temporomandibular joint disorder. Thus, therapy should be directed towards reducing stress, rehabilitating the occlusion and relaxing the muscles to alleviate the condition.

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